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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,577	04/21/2004	Herbert Bittl	P04,0152	5282
26574	7590	07/27/2005	EXAMINER	
SCHIFF HARDIN, LLP PATENT DEPARTMENT 6600 SEARS TOWER CHICAGO, IL 60606-6473			YUN, JURIE	
			ART UNIT	PAPER NUMBER
			2882	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/828,577	<b>Applicant(s)</b> BITTL, HERBERT	
	<b>Examiner</b> Jurie Yun	<b>Art Unit</b> 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

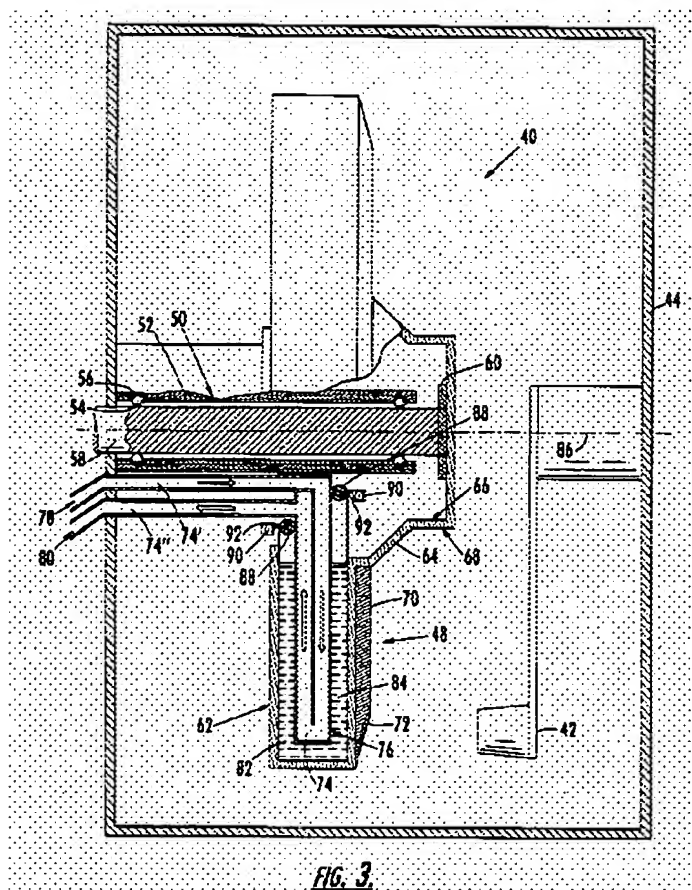
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 and 5-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bittl (USPN 4,949,369) in view of Snyder (USPN 6,430,260 B1).
4. With respect to claim 1, Bittl discloses an x-ray tube comprising: a vacuum housing (3); a stationary cathode (1) disposed in said vacuum housing; an axle (5) fixedly attached to said vacuum housing and proceeding through an interior of said vacuum housing; a ring projection (16) fixed to said axle, and having an outer surface (17); a rotating anode (2) formed by a hollow body surrounding said axle and having an interior, having an inner surface, in which said ring projection is disposed with a gap existing between said inner surface of said interior of said hollow body and said outer surface of said ring projection.

Bittl discloses all of the elements except for a liquid metal filling said gap forming with said gap a liquid-metal fluid bearing for said rotating anode, allowing rotation of said hollow body around said axle. Snyder discloses a liquid metal (column 6, lines 58-

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60) filling said gap (Fig. 3, 84) forming with said gap a liquid-metal fluid bearing for said rotating anode (48), allowing rotation of said hollow body around said axle (58).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to fill the gap in Bittl with a liquid metal, to provide for thermal coupling means, resulting in longer x-ray tube life and more powerful x-ray scans, as taught by Snyder.

5. With respect to claim 2, Bittl, in view of Snyder, discloses the hollow body has body walls (9, 10, & 12) disposed adjacent said axle (5), and wherein the gap filled with the liquid metal continues between the body walls and the axle.

6. With respect to claim 3, Bittl discloses at least one sleeve (27 & 28) connected to one of said body walls and concentrically surrounding said axle (5) with a radial spacing from said axle.

7. With respect to claim 5, Bittl discloses a stator (29) mounted at an exterior of said vacuum housing (3), and wherein said sleeve forms a rotor, said stator and said rotor interacting to form an electromotor for driving said rotating anode (column 3, line 67 – column 4, line 2).

8. With respect to claim 6, Bittl discloses the hollow body is annular and has a substantially U-shaped cross section (see Figure).

9. With respect to claim 7, Bittl discloses the axle (5) passes completely through the rotating anode (2).

10. With respect to claims 8-10, Bittl discloses a channel (19) for coolant proceeding in said axle (5) and in said ring projection (16), wherein said channel in said ring projection is disposed next to said outer surface of said ring projection, and wherein said channel in said ring projection comprises a plurality of branched sub-channels (19a & 19b) (column 3, lines 14-21).

11. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bittl (USPN 4,949,369) in view of Snyder (USPN 6,430,260 B1) as applied to claims 1-3 above, and further in view of Runnoe (USPN 6,327,340 B1).

12. With respect to claim 4, Bittl and Snyder do not disclose the gap filled with the liquid metal continues into the radial spacing between said at least one sleeve (27 & 28)

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and said axle (5). Runnoe discloses liquid metal (column 7, lines 60-64) disposed in a gap (Fig. 5, 350) between the sleeve (334) and the axle (338). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the liquid metal continue into the radial spacing between the sleeve and axle, as this area would also benefit from the thermal coupling means to provide longer x-ray tube life, as taught by Runnoe.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Anderson et al. (USPN 5,541,975) disclose use of liquid metal for high thermal conductivity.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jurie Yun whose telephone number is 571 272-2497. The examiner can normally be reached on Monday-Friday 8:30-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jurie Yun  
July 20, 2005



EDWARD J. GLICK  
SUPERVISORY PATENT EXAMINER